

1 **WHAT IS CLAIMED IS:**

- 2 1. A rotary concrete mixing drum comprising:
3 an interior surface at least partially provided by a polymer impregnated with
4 a slip agent.
- 1 2. The drum of Claim 1 wherein the polymeric includes polyurethane.
- 1 3. The drum of Claim 1 wherein the slip agent has a surface energy less than
2 the surface tension of a Portland Cement low slump concrete.
- 1 4. The drum of Claim 1 wherein the slip agent has a surface energy of less
2 about 20 dynes per centimeter.
- 1 5. The drum of Claim 1 wherein the slip agent is a polydecene.
- 1 6. The drum of Claim 1 wherein the slip agent is a polyalpha olefin fluid.
- 1 7. The drum of Claim 1 wherein the slip agent is polytetraflourethylene.
- 1 8. The drum of Claim 1 wherein the polymeric material is polyurethane,
2 wherein the slip agent is polytetraflourethylene and wherein at least 2% by weight of the
3 impregnated polymer is polytetraflourethylene.
- 1 9. The drum of Claim 8 wherein no greater than 5% by weight of the
2 impregnated polymer along the surface is polytetraflourethylene.
- 1 10. The drum of Claim 1 wherein the polytetraflourethylene is about 2% by
2 weight of the impregnated polymer along the surface.
- 1 11. The drum of Claim 1 wherein the polymer is polyurethane and wherein the
2 slip agent is a polyalpha olefin.
- 1 12. The drum of Claim 11 wherein no greater than 5% of weight of the
2 impregnated polymer is the polyalpha olefin.
- 1 13. The drum of Claim 12 wherein at least 2% by weight of the impregnated
2 polymer is the polyalpha olefin.

1 14. The drum of Claim 11 wherein at least 2% by weight of the impregnated
2 polymer is the polyalpha olefin.

1 15. The drum of Claim 11 wherein the polyalpha olefin comprises about 3% by
2 weight of the impregnated polymer along the surface.

1 16. The drum of Claim 1 wherein the slip agent is configured so as to not
2 substantially migrate within the polymer.

1 17. The drum of Claim 1 including:
2 an inner layer including the impregnated polymer along the inner surface;
3 and
4 an outer layer providing an exterior surface of the drum.

1 18. The drum of Claim 17 wherein the outer layer is non-metallic.

1 19. The drum of Claim 18 wherein the outer layer includes fiberglass.

1 20. The drum of Claim 19 wherein the outer layer includes:
2 fiberglass windings about the inner layer;
3 a first layer of chopper fiberglass over the windings, the first layer having a
4 ground surface with pores; and
5 a second layer of chopper fiberglass over the first layer and across the pores.

1 21. The drum of Claim 20 wherein the first layer has a first thickness and
2 wherein the second layer has a second lesser thickness.

1 22. The drum of Claim 20 wherein the first layer has a thickness of about 0.25
2 inch and wherein the second layer has a thickness of about 0.05 inch.

1 23. The drum of Claim 20 wherein the second layer has a thickness of about 0.1
2 inch.

1 24. The drum of Claim 20 wherein the ground surface has a smoothness from
2 being ground by a 16 grit abrasive.

1 25. The drum of Claim 17 wherein the outer layer includes:

2 fiberglass windings about the inner layers;
3 a sacrificial layer over the windings, wherein the sacrificial layer has a
4 surface having pores; and
5 a top layer over the sacrificial layer and across the pores.

1 26. The drum of Claim 17 wherein the outer layer is metallic.

1 27. The drum of Claim 1 wherein the impregnated polymer has a tensile strength
2 of at least 15 MPa.

1 28. The drum of Claim 1 wherein the impregnated polymer has a Modulus 300%
2 of at least 12 MPa.

1 29. The drum of Claim 1 wherein the impregnated polymer has a tear strength of
2 at least 68 kN/m.

1 30. The drum of Claim 1 including inwardly extending projections configured to
2 move material as the drum is rotated, wherein the projections partially provide the interior
3 surface of the drum.

1 31. The drum of Claim 30 wherein the projections have an exterior surface
2 including the impregnated polymer.

1 32. The drum of Claim 31 wherein at least a portion of one of the projections has
2 a thickness completely formed from the impregnated polymer.

1 33. A fin for use in a concrete mixing drum, the fin comprising:
2 an exterior surface at least partially provided by a polymer impregnated with
3 a slip agent.

1 34. A drum barrel for a concrete mixing drum, the barrel comprising:
2 an interior surface at least partially provided by a polymer impregnated with
3 a slip agent.

1 35. A method for forming a concrete mixing drum, the method comprising:
2 impregnating a polymer with a slip agent; and
3 forming an interior surface of a concrete mixing drum with the impregnated
4 polymer.

1 36. The method of Claim 35 including molding the impregnated polymer.

1 37. The method of Claim 35 including spraying the impregnated polymer.

1 38. The method of Claim 35 wherein the slip agent includes
2 polytetrafluorethylene.

1 39. The method of Claim 37 wherein impregnating includes mixing
2 polytetrafluorethylene powder with a polyol.

1 40. The method of Claim 39 wherein mixing comprises high sheer mixing.

1 41. The method of Claim 40 wherein mixing is performed using a Cowles blade
2 mixer.

1 42. The method of Claim 35 including:
2 molding the impregnated polymer into a first section;
3 forming an interior of the drum with the section; and
4 applying fiberglass to an exterior of the first section.

1 43. The method of Claim 42 including:
2 molding the impregnated polymer into a second section;
3 coupling the second section to the first section to form the interior of the
4 drum; and

5 applying fiberglass windings to an exterior of the second section.

1 44. The method of Claim 43 wherein the first section and the second section are
2 helical and wherein coupling includes screwing the first section and the second section
3 together.

1 45. The method of Claim 43 including:
2 applying a sacrificial layer of fiberglass over the windings;
3 grinding the sacrificial layer to form a ground exterior surface having pores;
4 and
5 applying a top layer of fiberglass over the ground exterior surface.

1 46. A method for finishing an exterior of a concrete mixing drum having a
2 preliminary exterior surface, the method comprising:
3 applying a sacrificial layer of fiberglass over the preliminary exterior
4 surface;
5 grinding the sacrificial layer to form a ground surface having pores; and
6 applying a top layer on the ground surface over the pores.

1 47. The method of Claim 46 wherein the sacrificial layer is ground using an
2 abrasive having at least a 16 grit.

1 48. The method of Claim 46 wherein the top layer is chopper fiberglass.

1 49. The method of Claim 48 wherein the top layer has a thickness of less than
2 0.50 inches.

1 50. A concrete mixing truck comprising:
2 a chassis;
3 a cab supported by the chassis;
4 a drum supported by the chassis and extending over the cab, the drum having
5 the first section extending in an archimedial spiral along an axial center line of the drum;
6 and
7 a second section extending in an archimedial spiral along the axial center line
8 of the drum, wherein the first section and the second section extend adjacent to one another.

1 51. A concrete mixing drum comprising:
2 a barrel having an inner surface and an outer surface; and
3 at least one projection spirally extending along the inner surface, wherein the
4 inner surface is provided by a polymer and wherein the outer surface has a convex portion
5 and a concave portion.

1 52. The drum of Claim 51 wherein the concave portion is located along an axial
2 midsection of the drum.

1 53. The drum of Claim 51 wherein the convex portion and the concave portion
2 are integrally formed as a single unitary body.

1 54. The drum of Claim 53 wherein the convex portion and the concave portion
2 are formed from fiberglass windings.

1 55. The drum of Claim 51 wherein the inner surface is at least partially provided
2 by a first archimedial section.

1 56. The drum of Claim 51 wherein the projections are integrally formed as a
2 single unitary body with the inner surface of the barrel.

1 57. The drum of Claim 55 wherein the inner surface is provided by a second
2 archimedial section screwed about the first section, wherein the first section and the second
3 section each have an exterior mid-portion concave surface.

- 1 58. A rotary concrete mixing drum comprising an interior surface at partially
2 provided by a material including one of a slip agent or strength-durability agent
3 impregnated within the other of the slip agent or strength/durability agent.